Supplementary Information

Fig S1. Comparison of Google Earth Pro satellite-derived images of Mullins Reef in 2016 (A and C) and 2023 (B and D). The yellow polygon encloses the area that contained most of the population of *Acropora palmata* based on field surveys conducted in 2015 and 2016. Panels C and D are close-ups of panels A and B, respectively. The small dark spots against the paler reef background, particularly visible near the mid-section of the polygon (see yellow arrow in C and D), are *A. palmata* colonies (see Oxenford et al. 2024). Although the quality of the image for 2016 (A and C) is poorer than that of 2023 (B and D), precluding a rigorous quantitative comparison, the area covered by the colonies in 2023 seems at least as large or larger than that of 2016.

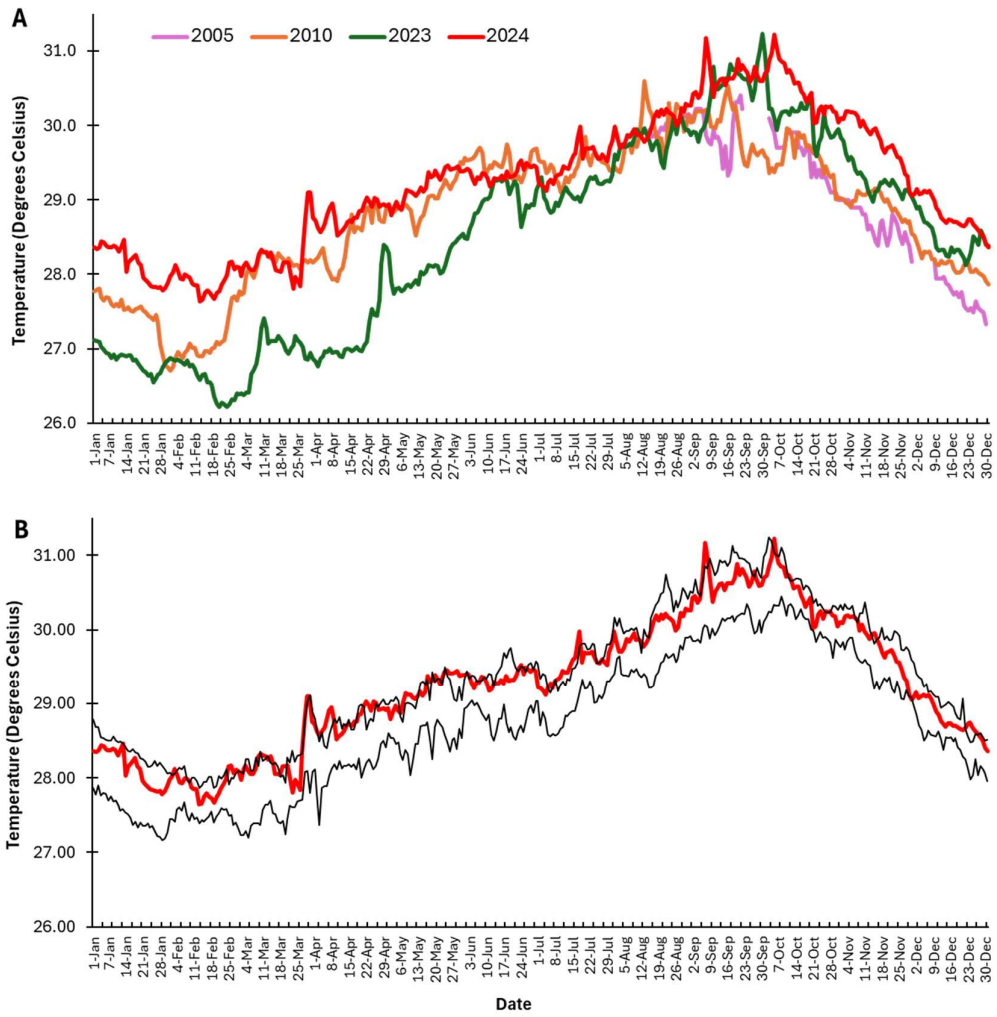

Fig S2. Sea surface temperature in situ profiles at 4 m deep at nearshore site midway along the west coast of Barbados for A) the four warmest years in Barbados in the last two decades (2005, 2010, 2023 and 2024) and B) for 2024 (red line) in comparison with the minimum and maximum sea surface temperature estimates derived from satellite imagery by NOAA Coral Reef Watch for the Windward Caribbean Islands (black lines). Daily *in situ* temperature estimates in 2024 were within the minimum and maximum satellite-derived estimates in 74% of the days, with relatively small deviations when they exceeded the maximum satellite-derived daily estimates (median: +0.08 degrees Celsius, n=96 days). In 2023, temperature data were missing between May 14 and September 9 at the reference site; data for this period were thus derived from a site further south on the west coast that exhibited a nearly identical temperature profile as the main reference site. In 2005, *in situ* temperature data were only available from August 16 onward, with some minor data gaps thereafter.

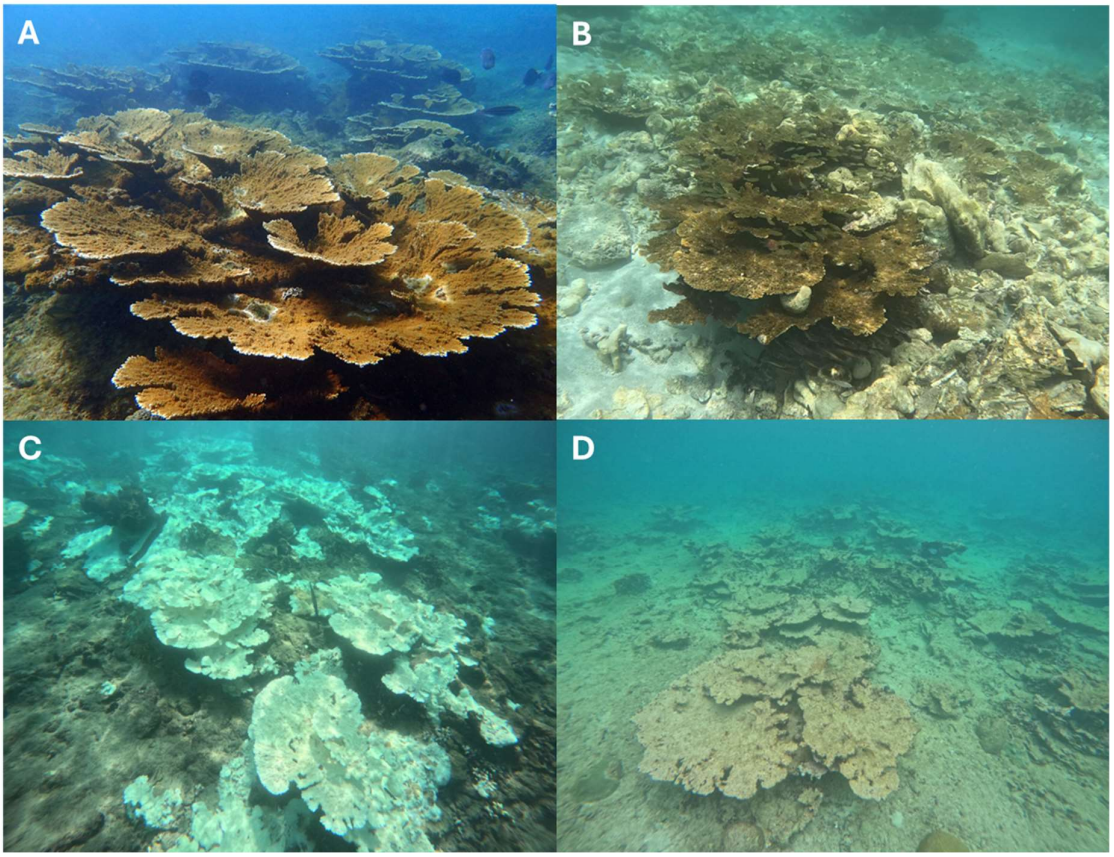

Figure S3. Landscape photographs of Mullins reef showing the fate of the *Acropora palmata* population A) healthy population prior to recent climate disturbances, B) physical damage from Hurricane Beryl in July 2024, C) 100% bleaching in October 2024, and D) extirpation of population in January 2025.